
%	The symbol for percent.
°	The symbol for degree.
°C	The symbol for degree Celsius.
>	The symbol for greater than.
<	The symbol for less than.
±	The symbol for plus or minus.
µm	The symbol for micron.
2-D	The abbreviation for two-dimensional.
3-D	The abbreviation for three-dimensional.
Aboriginal person	Any Indian, Inuit or Métis person who was born in the Northwest Territories or who is descended from an Aboriginal person born in the Northwest Territories.
access road	A temporary, permanent, or winter road that provides access to a facility, camp site, borrow site, barge landing site or a pipeline right-of-way and that is not open to the public.
Active I water crossing	A water channel that has a perennial flow or is partially frozen to the channel bed during winter.
Active II water crossing	A water channel that is frozen to the bed or that has no flow during winter.
AGA	The abbreviation for American Gas Association.
all-weather road	A paved or unpaved, i.e., gravel, road that is open to traffic all year.
alluvial	Relating to or consisting of alluvium, or deposited by running water.
ambient conditions	The pressure, temperature and humidity of the medium surrounding an object, usually referring to atmospheric pressure and temperature conditions.
ambient temperature	The temperature of the medium surrounding an object.

GLOSSARY

anchor fields	The three natural gas fields, Niglintgak, Taglu and Parsons Lake, whose production will provide the initial volume of gas shipped in the Mackenzie Valley pipeline.
anisotropic	Showing different properties as to velocity of light transmission, conductivity of heat or electricity, compressibility, and so on, in different directions.
ANSI	The abbreviation for American National Standards Institute.
APG	The abbreviation for Aboriginal Pipeline Group.
API	The abbreviation for American Petroleum Institute.
archaeological	Pertaining to the study of human history and prehistory through the excavation of sites and the analysis of physical remains.
arctic pipeline	A buried or elevated pipeline that crosses permafrost terrain.
ASME	The abbreviation for American Society of Mechanical Engineers.
aspect	The compass orientation towards which a slope faces.
ASTM	The abbreviation for American Society for Testing and Materials.
availability	A unit of measure for the actual time a facility, pipeline, or other equipment is capable of providing service, if called upon.
backfill	The fill material used to cover a completed pipeline. Adequate fill material is provided above and below the pipe to prevent damage caused by loose rock, abrasion, shifting or washouts.
baseline	A surveyed condition that serves as a reference point to which later surveys are coordinated or correlated.
Bcf/d	The abbreviation for billion cubic feet per day.
bedrock	The solid rock underlying soil or any other unconsolidated surficial cover.
bench	A terrace of level earth or rock that is raised and narrow and that breaks the continuity of a declivity.
bentonite	A type of clay derived from the alteration of volcanic ash.
berm	A mound or wall of earth.
biophysical environment	An environment that includes air, noise, aquatic (hydrogeology, hydrology, water quality and fisheries) and terrestrial (soils, landforms, permafrost, vegetation and wildlife) conditions.

GLOSSARY

blanket	A layer of unconsolidated material thick enough to mask minor irregularities of the surface of the underlying unit, but still conform to the general underlying topography. A blanket is greater than 1 m thick and has no constructional forms typical of the materials' genesis. Outcrops of the underlying unit are rare.
block valve	A device, positioned at intervals along a pipeline, that controls the rate of flow in the pipeline, opens or shuts off the pipeline completely, or serves as an automatic or semi-automatic safety device.
blowdown	The act of emptying or depressurizing material in a vessel or pipeline.
BMI	The abbreviation for Battelle Memorial Institute.
borehole	The hole made by drilling or boring into the ground to study stratification, to obtain natural resources or to release underground pressures.
borrow material	Earth material, such as gravel or sand, that is taken from one location to be used as fill at another location.
borrow site	An area that could be excavated to provide material, such as gravel or sand, to be used, where required, by the project.
boulder	A worn rock with a diameter exceeding 256 mm.
buckling	The bending of a material supporting a compressive load.
CAPP	The abbreviation for Canadian Association of Petroleum Producers.
cathodic protection	A method of protecting a metal structure from corrosion by making its surfaces cathodic and controlling the location of anodic areas so that corrosion damage can be reduced to tolerable levels.
CGA	The abbreviation for Canadian Gas Association.
Charpy V-notch test	An impact test to determine the toughness of a metal, in which a freely swinging pendulum is allowed to strike and break a cantilevered, notched specimen. Also known as a <i>Charpy test</i> .
Charpy V-notch toughness	The measure of a metal's toughness, as determined by the Charpy V-notch test. Charpy toughness is measured in either joules or foot-pounds.
chromatograph	An analytical instrument that records the results of the chromatographic process, which is a method of separating and analyzing mixtures of chemical substances by chromatographic adsorption.
CISC	The abbreviation for Canadian Institute of Steel Construction.

GLOSSARY

civil construction	The planning, design, construction and maintenance of fixed structures and ground facilities for industry, transportation, use and control of water, or occupancy.
clay	The fraction of an earthy material containing the smallest particles, i.e., particles finer than 3 µm.
CO	The chemical formula for carbon monoxide.
CO₂	The chemical formula for carbon dioxide.
colluvial	Pertaining to colluvium.
colluvium	The loose, heterogeneous deposits at the foot of a slope or cliff, brought there mainly by gravity. Also known as <i>creep</i> .
combustion turbine	A heat engine that converts the energy of fuel into work by using compressed, hot gas as the working medium, and that usually delivers its mechanical output through a rotating shaft. Also known as a <i>gas turbine</i> .
commissioning	The act of charging a system and conducting tests to ensure that the system functions safely before start-up.
compression, gas	The process of increasing the pressure on gas to reduce its volume or cause it to flow. Natural gas is usually compressed for pipeline transportation.
compressive strain	A strain that causes an elastic body to shorten in the direction of the applied force.
compressor station	A facility containing equipment that is used to increase pressure to compress natural gas for transportation in a pipeline.
ConocoPhillips	The abbreviation for ConocoPhillips Canada (North) Limited.
continuous permafrost	A category of permafrost where more than 90% of all ground is frozen. Permafrost distribution along the Mackenzie Valley varies from extensive and continuous in the north to discontinuous and sporadic in the south.
Coriolis mass flow meter	An instrument that determines mass flow rate from the torque on a ribbed disk that is rotated at constant speed when fluid is made to enter at the centre of the disk and is accelerated radially.
creep	The loose, heterogeneous deposits at the foot of a slope or cliff, brought there mainly by gravity. Also known as <i>colluvium</i> .
CSA	The abbreviation for Canadian Standards Association.
custody transfer	The process of changing ownership of, or responsibility for, quantities of gas, petroleum or petroleum products.

GLOSSARY

custody transfer meter	A flowmeter that measures the minimum and maximum flow rates, operating pressures and temperatures of a pipeline's contents at the point of custody transfer. Any losses or gains resulting from inaccurate measurement of a custody-transfer meter are the responsibility of the pipeline company.
delta	An alluvial deposit, usually triangular, at the mouth of a river, stream, or tidal inlet.
deltaic	Of or relating to a delta.
dense-phase design	A pipeline design in which operating pressures are increased so that natural gas and natural gas liquids behave like a single fluid.
depth of cover	The distance from the top of a pipe to ground level after the trench has been backfilled.
directional drilling	A drilling method in which the wellbore intentionally deviates from the vertical.
discontinuous permafrost	A category of permafrost where some of the underlying ground is unfrozen. Permafrost distribution along the Mackenzie Valley varies from extensive and continuous in the north to discontinuous and sporadic in the south.
ditch	A long, narrow excavation dug in the earth in which a pipeline is buried. Also known as a <i>trench</i> .
DLE	The abbreviation for dry, low emission.
dolomite	A carbonate mineral with a composition of $\text{CaMg}(\text{CO}_3)_2$.
downhole	Pertaining to the wellbore.
drilling mud	The fluid circulated through the wellbore during rotary drilling of a hydrocarbon well or through the borehole for a horizontal directionally drilled water crossing.
ductility	The ability of a material to be plastically deformed by elongation, without fracture.
ecoclimatic region	An ecological area that has broad similarities in soil, relief and dominant vegetation. Also referred to as an <i>ecoregion</i> .
ecoregion	An ecological area that has broad similarities in soil, relief and dominant vegetation. Also referred to as an <i>ecoclimatic region</i> .
EEMAC	The abbreviation for Electrical and Electronic Manufacturers Association of Canada.

GLOSSARY

EIS	The abbreviation for Environmental Impact Statement.
emissions	Substances discharged into the air, e.g., by a smokestack or an automobile engine.
Enbridge	The abbreviation for Enbridge Pipelines (NW) Inc.
environmental impact assessment	The process of evaluating the biophysical, social and economic effects of a proposed project.
environmental impact statement	A report containing the environmental impact assessment.
eolian	Material that was eroded, transported or deposited by wind action.
EPA-NWT	The abbreviation for Electrical Protection Act of the Northwest Territories.
ephemeral watercourse	A watercourse that is present for only a short time.
erosion	The wearing away of the land surface by running water, wind, ice or other geological agents, including such processes as gravitational creep.
ESD	The abbreviation for emergency shutdown.
esker	A winding ridge of irregularly stratified sand, gravel and cobbles deposited under the ice by a rapidly flowing glacial stream.
EUB	The abbreviation for Alberta Energy and Utilities Board.
ExxonMobil	The abbreviation for ExxonMobil Canada Properties.
FCAW	The abbreviation for flux core arc welding.
fen	Low land, such as peat land, that is wholly or partly covered by water, especially in the upper regions of old estuaries and around lakes. These areas do not drain naturally.
fluvial	Relating to, or produced by, the action of a stream or river.
footprint	The amount and shape of the area disturbed.
frost bulb	A frozen zone, typically formed around a chilled pipe, in otherwise unfrozen ground.
frost heave	The raising of a surface caused by ice in the underlying soil. This movement results from alternate thawing and freezing. Frost heaving generates stress on vertical support members of pipelines in the Arctic and, as a result, also on the pipeline itself.

GLOSSARY

gas hydrate	A mixture of water and gas that forms a solid plug in a gas pipeline under certain conditions.
gas pipeline	The proposed gas pipeline that would extend from the Inuvik area facility, parallel to the NGL pipeline along the Mackenzie River to Norman Wells, and continue south to connect to an extension of the TransCanada PipeLines Alberta system south of the Northwest Territories–Alberta boundary. Also known as the <i>Mackenzie Valley pipeline</i> .
gas turbine	A heat engine that converts the energy of fuel into work by using compressed, hot gas as the working medium, and that usually delivers its mechanical output through a rotating shaft. Also known as a <i>combustion turbine</i> .
gathering system	A system of pipelines and related facilities that include four gathering pipelines, the Inuvik area facility, the NGL pipeline and related facilities, such as valves, pig launchers and receivers.
geotechnical	Pertaining to the application of scientific methods and engineering principles to civil engineering problems by acquiring, interpreting and using knowledge of materials of the crust of the earth.
geothermal	Pertaining to heat within the earth.
glaciofluvial material	Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice.
glaciolacustrine	Related to lakes fed by melting glaciers, or to the deposits forming in the lakes.
glycol	A group of compounds, such as ethylene glycol and diethylene glycol, used to dehydrate gaseous or liquid hydrocarbons, to inhibit the formation of hydrates, or to cool fluids (liquid or gas), by acting as a heat transfer medium.
GMAW	The abbreviation for gas metal arc welding.
GPS	The abbreviation for global positioning system.
grade, pipe	A designation of the pipe based on strength. Grade designation is nondimensional, but numerically equivalent to the specified minimum yield strength in megapascals. Grade 359 pipe material is equivalent to Grade X-52. Grade 550 pipe material is equivalent to Grade X-80.
grading	The process of constructing a work area to facilitate moving personnel, equipment and material onto and along a right-of-way. The process includes levelling, cutting and filling. The travel surface is similar to a winter road.

GLOSSARY

ground bed	In cathodic protection, an interconnected group of impressed-current anodes that absorbs the damage caused by generated electric current. An impressed-current anode is an anode to which an external source of positive electricity is applied.
groundwater	The water within the earth that supplies water wells and springs.
HDD	The abbreviation for horizontal directional drilling.
heat conductivity	The heat flow across a surface per unit area per unit time, divided by the negative of the rate of change of temperature with distance in a direction perpendicular to the surface. Also known as <i>thermal conductivity</i> .
heater station	A facility where natural gas is heated to prevent the formation of hydrates.
heat medium	A static or flowing material, such as steam, used to transfer heat from a primary source to another material.
heat medium heater	A device that increases the temperature of a heat transfer fluid for use in changing the temperature of another fluid.
heat tracing	The process of maintaining temperature in a piping system by heating the system with mechanical or electrical components. Also known as <i>winterization</i> .
helipad	A cleared landing area for helicopters, located at camps and facilities.
hoop stress	The circumferential stress in a material of cylindrical form subjected to internal or external pressure.
horizontal directionally drilled water crossing	A river crossing technique used in pipeline construction in which the pipe is buried under the riverbed at depths much greater than conventional crossings. An inverted arc-shaped hole is drilled beneath the river and the assembled pipeline is pulled through it. Also known as a <i>trenchless crossing</i> .
hot bend	A tight bend in a pipeline that is beyond the capabilities of bending machines on the right-of-way. These tight bends in the pipe are made in the factory and shipped to the appropriate location on the right-of-way.
HSLA	The abbreviation for high strength, low alloy.
hummock	A rounded or conical mound or hillock, generally of equal dimensions and not ridge-like.
hydrate, gas	A mixture of water and gas that forms a solid plug in a gas pipeline under certain conditions.
hydraulics	The branch of science and technology concerned with the mechanics of fluids, especially liquids.

GLOSSARY

hydrocarbons	Organic compounds of hydrogen and carbon whose densities, boiling points, and freezing points increase as their molecular weights increase. Petroleum is a mixture of many different hydrocarbons.
ice road	A secondary road made of compact snow or ice, often ploughed over a frozen lake or ground, and that is impassable in the summer. Also known as a <i>winter road</i> .
IEC	The abbreviation for International Electrotechnical Commission.
IEEE	The abbreviation for Institute of Electrical and Electronic Engineers.
incident	A specific unplanned event or sequence of events that has an unwanted and unintended effect on people's safety or health, on property or the environment, or on regulatory compliance.
inelastic deformation	The deformation caused by a material's inability to sustain a deformation without permanent change in size or shape.
infrastructure	Basic facilities, such as transportation, communications, electrical power supplies and buildings, that enable an organization, project or community to function.
inlet separator	A vessel located at the entrance to a hydrocarbon facility that separates the incoming stream into different components, such as gas and liquids.
Inuvik area facility	The facility near Inuvik that processes and separates gas and NGLs delivered from the gathering pipelines and which directs the processed streams to the NGL and gas pipelines.
ISA	The abbreviation for Instrument Society of America.
ISO	The abbreviation for International Standards Organization.
J	The metric symbol for joule.
joule	The unit of energy or work in the metre-kilogram-second system of units, equal to the work done by a force of 1 newton. Also known as a <i>newton-metre of energy</i> .
Joule-Thomson effect	A change in temperature of a gas undergoing Joule-Thomson expansion.
Joule-Thomson expansion	The adiabatic, irreversible expansion of a fluid flowing through a porous plug or partially opened valve. Also known as <i>Joule-Thomson process</i> .
kilometre post	A marker for each kilometre along the centreline of the right-of-way used for reference points.
km	The metric symbol for kilometre.

GLOSSARY

km³/d	The abbreviation for thousand cubic metres per day.
KP	The abbreviation for kilometre post.
kPa	The metric symbol for kilopascal.
kPa(a)	The metric symbol for kilopascal absolute.
kPa(g)	The metric symbol for kilopascal gauge.
lacustrine	Belonging to or produced by lakes.
large water crossing	A water channel that appears with a name on 1:50,000 Government of Canada topographic maps, and has a perennial flow and a drainage area greater than 1,000 km ² .
lateral, pipeline	A gathering pipeline that connects the production area facilities to the Inuvik area facility.
LiDAR	A light detection and ranging technique for aerial surveying, derived from <i>laser infrared radar</i> .
limestone	A sedimentary rock rich in calcium carbonate.
limit state	A condition where a pipeline no longer meets one or more design requirements. Serviceability limit states restrict normal operations or reduce durability. Ultimate limit states are thresholds beyond which pressure containment, safety or the environment are threatened.
line pipe	Sections of pipe that can be welded together to form a pipeline.
looping, pipeline	A method of increasing capacity on a pipeline, by laying additional pipe alongside part or all of an existing pipeline.
m	The metric symbol for metre.
m³/d	The metric symbol for cubic metres per day.
Mackenzie Valley pipeline	The proposed gas pipeline that would extend from the Inuvik area facility, parallel to the NGL pipeline along the Mackenzie River to Norman Wells, and continue south to connect to an extension of the TransCanada PipeLines Alberta system south of the Northwest Territories–Alberta boundary. Also known as the <i>gas pipeline</i> .
material balance	A calculation to inventory material inputs versus outputs.
material safety data sheet	A document that provides information on the chemical and physical properties, health information, first aid measures, protective precautions, fire hazards and reactivity data for chemical compounds.

GLOSSARY

meter station	A facility where the flow of gas or natural gas liquids is recorded. Meter stations are located at key transfer points, such as the Inuvik area facility where natural gas flows from the gathering system to the Mackenzie Valley pipeline and NGLs to the NGL pipeline.
mg/m³	The metric symbol for milligrams per cubic metre.
mitigate	To cause to become less harsh or hostile.
mm	The metric symbol for millimetre.
Mm³/d	The metric symbol for million cubic metres per day.
module	A standardized part or an independent self-contained unit of facilities or structures, such as buildings, used in construction. The modules are generally prefabricated and packaged in manageable sizes and weights for ease of transportation and assembly on site.
mol%	The abbreviation for mole percent.
molar	Denoting a physical quantity divided by the amount of substance expressed in moles.
MOP	The abbreviation for maximum operating pressure.
moraine	An accumulation of glacial drift deposited by a glacier.
MPa	The metric symbol for megapascal.
MSDS	The abbreviation for material safety data sheet.
MSS	The abbreviation for Manufacturers Standardization Society.
muskeg	A peat bog or tussock meadow, with variably woody vegetation.
MW	The abbreviation for megawatt.
N/A	The abbreviation for not applicable.
N₂	The chemical formula for nitrogen.
NACE	The acronym for the National Association of Corrosion Engineers.
NAD	The abbreviation for North American Datum. The datum is identified by its year (e.g., NAD 1983 or NAD 83).
natural gas	A compressible mixture of hydrocarbons with a low specific gravity that occurs naturally in a gaseous form.

GLOSSARY

natural gas liquids	Hydrocarbons that are gaseous in the reservoir, but that will separate out in liquid form at the pressures and temperatures at which separators normally operate. The liquids consist of varying proportions of butane, propane, pentane and heavier fractions, with little or no methane or ethane.
NBC	The abbreviation for National Building Code of Canada.
NEB	The abbreviation for the National Energy Board.
NEMA	The abbreviation for National Electrical Manufacturers Association.
newton-metre of energy	The unit of energy or work in the metre-kilogram-second system of units, equal to the work done by a force of 1 newton. Also known as a <i>joule</i> .
NFPA	The abbreviation for National Fire Protection Association.
NGL	The abbreviation for natural gas liquid.
NGTL	The abbreviation for NOVA Gas Transmission Ltd.
NO_x	The chemical formula for oxides of nitrogen.
NPS	The abbreviation for nominal pipe size.
NWT	The abbreviation for Northwest Territories.
OLGA	A PIPEPHASE modelling correlation that is used to predict steady-state pressure drops, liquid holdup and flow-regime transitions.
open cut	A water crossing technique used in pipeline construction where a trench is cut into the riverbed.
organic compounds	Chemical compounds, naturally occurring or otherwise, that contain carbon, with the exception of carbon dioxide (CO ₂) and carbonates (e.g., CaCO ₃).
overburden	All material, including soil, sand, silt or clay, that lies on top of the pipeline.
overwintering habitat	A habitat used by a species to survive the winter.
P&ID	The abbreviation for process and instrumentation diagram.
pad	The surface parts of a multiwell drilling or production site, including wells, buildings, piping and electrical facilities.
particulate matter	Fine solid materials that remain individually dispersed in gases and stack emissions.

GLOSSARY

peat	The unconsolidated soil material consisting largely of undecomposed, or only slightly decomposed, organic matter, such as mosses, sedges and other plants that grow in marshes or other wet places.
permafrost	Perennially frozen ground, occurring wherever the temperature remains below 0°C for two or more consecutive years.
pig	An in-line scraper, i.e., brush, blade cutter or swab, that is forced through a pipeline by fluid pressure. The pig is used to remove scale, sand, water and other foreign matter from the interior surfaces of the pipe.
pigging	The act of pushing a pig through a pipeline to physically clean deposits from the inner surface of the pipeline, to remove liquids, or to conduct internal inspections of the pipeline.
pigging facilities	Facilities for launching and receiving pigs.
pig, smart	An inspection tool that is equipped with data-collection devices that relay detailed information about the pipeline to the operator as the pig travels down the pipe.
pipe finger	A segment of pipe.
pipeline	A line of pipe connected to valves and other control devices, for conducting fluids, gases or finely divided solids.
pipeline corridor	The 1-km-wide area that centres on the combined right-of-way for the gas and NGL pipelines, from the Inuvik area facility south to the NGTL interconnect facility in Alberta.
pipeline interconnection	The point at which facilities of two or more pipelines interconnect.
plain	A level or very gently sloping, unidirectional (planar) surface with gradients up to and including 3° (5%). Local surface irregularities generally have a relief of less than 1 m.
polygons	The arrangements of rock, soil and vegetation formed on a level or gently sloping surface by frost action.
ppmw	The abbreviation for parts per million by weight.
pressure testing	The final quality control check of the structural soundness of a pipeline or facility. In this test, the line is filled with water or a glycol–water mixture and pressurized to a designated point. This pressure is maintained for a specific period of time. Any ruptures or leaks revealed by the test are repaired. The test is repeated until no problems are noted. Also known as <i>hydrostatic testing</i> .
production	The operation of bringing raw natural gas to the surface for processing.

GLOSSARY

proponents	The five organizations (Imperial Oil Resources Ventures Limited, the APG, ConocoPhillips, Shell and ExxonMobil) that are undertaking the Mackenzie Valley pipeline.
public consultation	The process of involving all affected parties in the design, planning and operation of a project. The process requires that the proponents give the parties to be consulted notice of the matter in sufficient form and detail to allow them to prepare their views on the matter. They are also given a reasonable amount of time to prepare their views and an opportunity to present their views to the proponents, who consider the views presented, fully and impartially.
pumping station	A facility containing equipment that is used to increase the pressure of a liquid, such as NGL, for further transportation in a pipeline.
reconnaissance survey	A high-level biophysical survey that does not include a detailed sample regime.
reservoir	A subsurface, porous, permeable rock body containing a natural accumulation of oil or gas, or both.
revegetation	The process of providing denuded land with a new cover of plants.
right-of-way	The right of passage or of crossing over someone else's land. Also, an easement in lands belonging to others that is obtained by agreement or lawful appropriation for public or private use.
ROW	The abbreviation for right-of-way.
RP	The abbreviation for recommended practice.
RWED	The abbreviation for the Department of Resources, Wildlife and Economic Development, in the Northwest Territories.
sandstone	A consolidated rock composed of sand grains cemented together.
SAW	The abbreviation for submerged arc welding.
scour	Erosion within a stream bed caused by the flow of water or ice.
sedimentary rock	A rock composed of materials that were transported to their present position by water or wind.
segregation potential	A parameter in the empirical equation used to estimate frost heave rate. The temperature gradient, multiplied by the segregation potential, equals the heave rate.

GLOSSARY

shale	A fine-grained laminated or fissile sedimentary rock made up of silt or clay-size particles. It generally consists of about one-third quartz, one-third clay materials and one-third miscellaneous minerals, including carbonates, iron oxides, feldspars and organic matter.
Shell	The abbreviation for Shell Canada Limited.
shielded metal arc welding	Arc welding in which heating with an electric arc between the electrode and the work produces fusion of the electrode covering, which shields the work.
shipper	An individual or company that contracts with a gathering, transmission or distribution system for transporting natural gas.
shutdown	The act of stopping work temporarily or stopping a machine or piece of equipment in operation.
side bend	A deflection in the horizontal plane of the pipe, made to accommodate a change in direction of the pipeline.
silt	Fine sand, clay or other soil carried by moving or running water and deposited as sediment on the bottom or on the shore of a lake or stream.
single-phase design	A pipeline design that requires separate pipelines for natural gas and for NGLs.
slash	Woody debris, e.g., limbs and branches, that is removed from large timber.
slug catcher	A vessel or series of pipes to collect liquids at the inlet of a pipeline facility, such as a compressor station.
smart pig	An inspection tool that is equipped with data-collection devices that relay detailed information about the pipeline to the operator as the pig travels down the pipe.
SMAW	The abbreviation for shielded metal arc welding.
socio-economics	The study of social and economic factors.
span lengths	The occurrence and length of unfrozen and frozen soil intervals.
spawning, habitat	A particular type of area where a fish species chooses to reproduce. Preferred habitat (substrate, water flow and temperature) varies from species to species.
spoil	Subsoil material that is excavated, such as from a pipeline trench or areas subject to grading, and that is to be kept separate from surface soil.
stakeholders	People or organizations with an interest or share in an undertaking, such as a commercial venture.

GLOSSARY

start-up	The act of recommencing work or starting up machinery or equipment after a temporary shutdown or decommissioning.
sweet natural gas	Gas that has no more than the maximum sulphur content, as defined by the specifications for the sales gas from a plant or by a legal body.
t	The metric symbol for tonne.
t/d	The metric symbol for tonnes per day.
taiga	A large temperate forest zone characterized by forests drawing on discontinuous permafrost and mineral soils.
talik	The permanently unfrozen ground in regions of permafrost. Usually applies to a layer that lies above the permafrost, but below the active layer, that is, when the permafrost table is deeper than the depth reached by winter freezing from the surface.
terrace	A single or assemblage of step-like forms where each step-like form consists of a scarp face and a horizontal or gently inclined surface (tread) above it.
terrain	The physical surface features of a tract of land.
thaw settlement	Settlement that results from ice melting in the soil. Settlement depends on thaw depth, ice content and soil gradation.
thermal conductivity	The heat flow across a surface per unit area per unit time, divided by the negative of the rate of change of temperature with distance in a direction perpendicular to the surface. Also known as <i>heat conductivity</i> .
thermokarst	An irregular land surface formed in a permafrost region by melting ground ice.
tie-in	A collective term for the construction tasks bypassed by regular crews on pipeline construction. Tie-in includes welding road and river crossings, valves, portions of the pipeline left disconnected for hydrostatic testing, and other fabrication assemblies, as well as taping and coating the welds.
topography	The configuration of a surface, including its relief and natural and artificial features.
trenchless crossing	A river crossing technique used in pipeline construction in which the pipe is buried under the riverbed at depths much greater than conventional crossings. An inverted arc-shaped hole is drilled beneath the river and the assembled pipeline is pulled through it. Also known as a <i>horizontal directionally drilled crossing (HDD)</i> .
trench	A long, narrow excavation dug in the earth in which a pipeline is buried. Also known as a <i>ditch</i> .

GLOSSARY

tributary	A stream that feeds or flows into or joins a larger stream or a lake.
tundra	A vast treeless zone, lying between the ice cap and the timberline of North America and Eurasia, that has a permanently frozen subsoil.
turndown conditions	Conditions during which a pipeline or equipment operates at less than design flow.
two-phase design	A pipeline design that allows the concurrent movement of two phases, such as liquid and gas, through a single pipeline.
upset condition	An abnormal process operation that might result in flaring or shutdown, depending on the degree of upset.
utilities	Systems of electricity, natural gas, water, sewer drains and other services.
UTM	The abbreviation for Universal Transverse Mercator.
vegetated channel	A watercourse with ephemeral flow, no discernible banks or sediment transport, and a drainage area less than 15 km ² . It is primarily a shallow flow through shrubs and trees during spring runoff or rainfall. It is dry most of the year.
veneer	A mantle of unconsolidated materials too thin to mask the minor irregularities of the surface of the underlying material. It is between about 10 cm and 1 m thick and possesses no constructional form typical of the material genesis.
wastewater	Water that is mostly vapour condensed from natural gas and any free water produced with the natural gas.
water crossing	A location where a pipeline crosses a stream or a river. Also known as a <i>watercourse crossing</i> .
winter road	A secondary road made of compact snow or ice, often ploughed over a frozen lake or ground, which is impassable in the summer. Also known as an <i>ice road</i> .
winterization	The process of maintaining temperature in a piping system by heating the system with mechanical or electrical components. Also known as <i>heat tracing</i> .
W/m°C	The abbreviation for watts per metre per °C.
wrinkling, pipe	Waviness around the edges of the pipe wall.
yield stress	The lowest stress at which extension of the tensile test piece increases without increase in load.

GLOSSARY
